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Civilian Satellites Penetrate Soviet Secrecy, Photograph Plant

Space Competition Takes New Direction

By Nell Henderson
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A new kind of space competition was launched this week as the western world turned to two civilian satellites to penetrate the Soviet cloak of secrecy and produce photographs of the damaged nuclear reactor at Chernobyl.

Unable to obtain aerial photos of the site within the Soviet Union, western news agencies gained their first overhead glimpse of the reactor Tuesday from Landsat, the U.S. government-owned remote sensing satellite that has sold space photos of the Earth since 1972.

Then yesterday a new French satellite produced a more detailed view of the reactor, showing damage to the ground next to the reactor and breaking Landsat's 14-year monopoly on such service.

Computer analysis of the photo, taken from 500 miles above the earth by the French Spot satellite and released in Sweden, showed that smoke had stopped billowing from the reactor and revealed a long dark scorch mark on the ground next to the reactor, said Robert Lees, an image analyst for Spot Image Corp., of Reston, the wholly owned subsidiary of the French company created to market Spot's services.

The mark, at least 600 feet long, is believed to be "the probable result of a blast," Lees said. Damage to the building cannot be discerned from the photo, but it is clear that the smoke visible on the earlier Landsat photo is gone, he said. Lees cautioned, however, that the lack of smoke does not mean the fire at the reactor is out.

The Landsat photo revealed less detail of the plant itself, but covered a larger area and used infrared viewing to show vegetation surrounding the concrete facility.

While feeding an information-hungry world with images of an inaccessible site, the two photos illustrated the strengths and weaknesses of the only two non-military satellites that sell their services to anyone who will pay the price.

Landsat, the old war horse of civilian space photography, provided the first photo. Spot, only launched in February, was slower because the satellite is so new, but provided a level of detail previously available only to the military. Technically not yet open for business, Spot's capabilities have already thrown earth-bound news agencies, lawyers and diplomats into a spin over the possibilities of a new era in civilian space-based photography.

The technology is not entirely new—Soviet and U.S. military satellites are said to be capable of reading license plates and newspaper headlines from space. What is new is the detail now available to the public, and the two local companies now competing to sell it.

Since 1972, farmers, oil companies, geologists, foresters, foreign governments and others interested in land resource management have bought satellite photos taken by Landsat. The photos covered broad expanses of the Earth, showing erosion and vegetation patterns, broad coastlines and mountain ranges. The smallest discernible object is 98 by 98 feet.

Spot, by contrast, covers a smaller area, but offers black and white photos of 10 meter resolution, which means an object 33 feet by 33 feet in size, or about half the size of a tennis court, can be identified. The photos show clearly discernible roads, bridges, airlines, piers and ships.

Spot represents a $300 million investment by the French government. Neither satellite actually takes photographs: Their electronic sensors record energy reflected off the Earth's surface. The data is collected on computer tape that can be used to create a photograph or even by transferred onto a floppy disk.

Spot's prices range from $155 for a black and white print to $2,550 for a top-of-the-line computer-compatible tape. Landsat's data is marketed by the Earth Observation Satellite Co. (Eosat), based in Lanham, a joint venture of Hughes Aircraft Co. and RCA Corp. Eosat's prices vary from $50 to $3,300.

Eosat says Landsat has the advantage of being able to record images in a wider range of spectral bands than Spot. Photographs in some infrared bands are able to identify certain minerals that Spot images cannot detect, Eosat President Charles P. Williams said.

Spot, however, has the advantages of being able to view the same site more frequently than Landsat. Both Landsat and Spot circle the globe in near polar orbits. Landsat covers nearly every location on earth in 16 days, while Spot takes 26. But while Landsat's sensors "look" straight down, Spot's mirrors allow the sensors to "look" to either side—thus Landsat can catch a particular site once every 16 days, while Spot can view the same location about twice a week. By viewing a site from two angles, the satellite also can generate a stereoscopic image.

Thus, Landsat, by luck, obtained the first photo of the Chernobyl reactor but will not be able to get another for almost a month, while Spot may obtain another glimpse within a week.

Individuals, companies, U.S. government agencies or anybody else can buy Spot's services from the Reston-based subsidiary, while the rest of the world can turn to the parent company in Toulouse, France. That company, Spot Image S.A., is owned primarily by the French space agency, but also reflects investments by French banks and aerospace concerns, the Belgian and Swedish governments, and the Belgian telecommunications and aerospace industries.

Spot expects most of its business

[redacted] from traditional [redacted] users such as farmers monitoring their crops, geologists looking for mineral deposits and energy companies searching for oil and gas. But the company acknowledges that new uses are possible—that Iraq could buy photos of Iran, while Libya could buy photos of downtown Washington.

If buyers want a photo of President Reagan's ranch, all they have to do is provide the latitude and longitude, said David S. Julyan, director of sales and marketing for the U.S. Spot Image subsidiary. "We will acquire an image of any place in the world and make it available to any and all interested parties . . . I plan to open up every market I can."

While opening new windows on the world, the prospect of advanced satellites for hire also stretches space law beyond its current limits. News executives have begun asking whether the First Amendment will float in space if they buy photos of U.S. or Soviet military movements.

Foreign countries have expressed concern about other governments having access to satellite photos of their territories. Others foresee satellites as potential tools for corporate spying.

"It's so new—the constitutional issues are just being raised by the technology," said Robert A. Destro, a member of the U.S. Civil Rights Commission and an expert on constitutional law. "It's going to be tricky, but Spot is going to go a long way toward bringing First Amendment issues into the 21st century."

One of the keys to news agency interest is the prospect of obtaining overhead looks at territory where aerial photgraphy is not allowed. ABC News has used Landsat photos of the Iran-Iraq border, a Libyan military airfield and Soviet naval bases.

"We will have access to the world we wouldn't have otherwise," said Mark Brender, an ABC News editor and chairman of the media in space committee of the Radio-Television News Directors Association (RTNDA). "The time does not appear to be too far distant when privately held satellites and other orbital facilities will be as indispensible as the printing press and the camera to a free society."

News executives and their attorneys already have expressed concern about the possible clash between national security and space-based news gathering.

At some time the government might start to wonder if [Spot] revealed things they don't want revealed," said Robert Aamoth, a communications attorney representing RTNDA. "To impose restrictions on press use of remote sensing satellites would constitute prior restraint and would have to be justified by demonstrating a clear and present danger to national security."

RTNDA also has argued that the 1984 Landsat Act, which began the process of transferring Landsat to the private sector, grants "unbridled discretion" to the government to suspend, revoke or withold licenses on the basis of national security. "These provisions would be unconstitutional under the First Amendment for being unduly vague and overbroad, for allowing unjustified prior restraints to be imposed on the press, and for chilling constitutionally protected activities without an adequate justification," RTNDA's attorneys wrote the Transportation Department, which currently is developing rules to implement the act.

Spot, however, is owned by the French and therefore is "beyond U.S. jurisdiction," Aamoth said. "There would be no justification for preventing U.S. news agencies from getting pictures that are available to the rest of the world."

CIA Director William Casey, commenting on Spot at a recent meeting of newspaper executives, said the agency does not plan to restrict media use of the satellite: "Oh, I don't think there's anything we can do about it. Anybody can go out and get whatever information they can get, the press and anybody else in any other country. . . . I expect that large news organizations will have one of those satellites themselves one of these days."

Casey added, however, that "the press has a responsibility to listen and consider" the government when it argues that information should be witheld on national security grounds, and noted that such cooperation occurs frequently.

Destro, an assistant law professor at Catholic University, said that foreign governments may prove more difficult than our own, and that the pressure could be indirect. "What if Mikhail Gorbachev calls Ronald Reagan and says, 'Put a lid on ABC or no summit'?"

"If ABC got a U2 to fly over the Soviet Union, it probably would be shot down," Destro said. "Foreign governments might retaliate [against Spot], or might consider shooting down the satellite."

A State Department official familiar with remote sensing policy said the agency has no problem with Spot as long as it makes the data available on an open, equal, nondiscriminatory basis. Spot has vowed to stick with this policy, called "open skies," which was adopted by the U.S. government when foreign governments first expressed nervousness about Landsat.

The open skies approach is current U.S. foreign policy, but no international law requires other countries to follow if they launch remote sensing satellites. Some industry observers have argued that it would make business sense to offer exclusive rights to satellite photos, and news organizations have argued that they cannot consider investing in the technology unless they can have at least temporary rights to such photos so they can beat their competition.

Developing nations, however, are "not thrilled with open skies," said Ann Florini, a research director for the U.N. Association, a private, nonprofit research organization based in New York. "The big concern is lack of access to information about their own territory. They are worried they won't know what pictures are being taken by whom for what purpose."

Corporations might use Spot photos of their competitors' facilities much as they now use aerial photos, said Leila Kight, president of Washington Researchers Ltd, which investigates companies for other firms. "There is no reason not to use it for learning about competitors or acquisition targets. As soon as the knowledge is made available, there will be companies using it for that purpose."

Eosat sees the heavenly competition as a boost for both businessess. Both satellite companies plan to spend millions to educate new customers about the availability and quality of their products.

Spot Image foresees a potential worldwide market of about $100 million for its services, and expects sales to U.S. customers to generate almost half of total revenue. Eosat's sales were $20 million last year. Canadian and Japanese satellites are expected to heighten the competition within the next decade.

"The big deal is when you add together the different attributes of these systems," said Timothy Alexander, a partner in Satellite Development Services, based in the District. "We can only barely discern what we will be able to do."

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At left, the Chernobyl nuclear plant as photographed by the Landsat 5 satellite at 9:45 a.m. local Kiev time on Tuesday. The plant is located at the upper left edge of the cooling pond. Below left, an enlargement of the plant.

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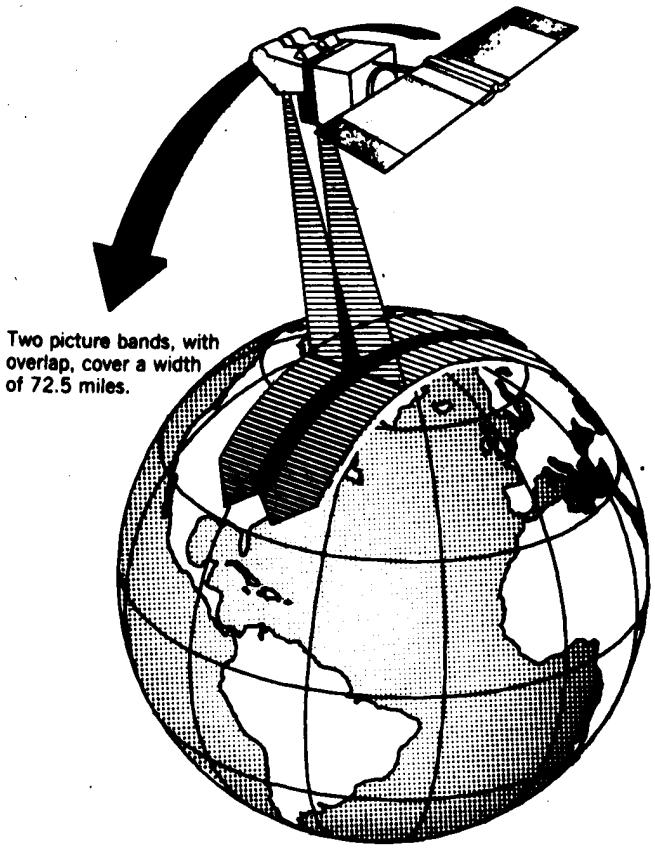
THE SPOT SATELLITE



The Spot satellite's orbit and adjustable mirrors enable it to produce photos of virtually every place on Earth, and to view the same location as often as twice a week. The satellite orbits the Earth moving from pole to pole as the Earth turns beneath it, taking 26 days to cover the globe. The mirrors allow Spot to view at an angle, enabling it to photograph locations directly beneath it and to the sides. Viewing at an angle, Spot can take two images of the same location within a few days and can produce a stereoscopic, or "three-dimensional" picture.

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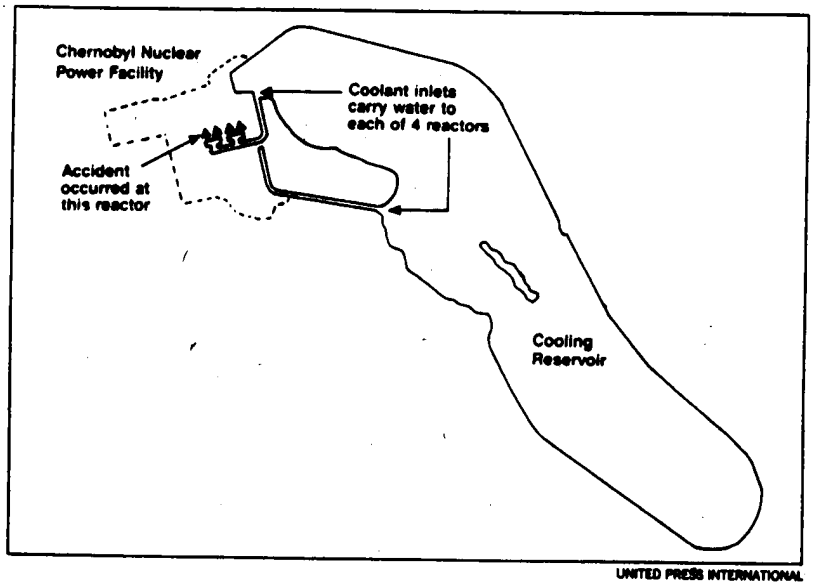

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